

CLAIMS

1. A polymer mixture containing at least one synthetic first polymer P(i) and at least one second polymer P(j) and optionally a swelling agent for P(i) and/or P(j), characterised in that the polymer P(i) has a degree of polymerisation  $DP(P(i)) > 500$  and at least one type of crystallisable sequences A having a degree of polymerisation  $DPs(P(i))$  of these sequences  $> 20$  and the polymer P(j) is made up of the same monomer units as the sequences A of P(i) and the degree of polymerisation  $DP(P(j))$  of P(j) is  $20 < DP(P(j)) < 500$  and the polymer mixture comprising a molecularly dispersed mixture containing P(i) and P(j) forms a network under heterocrystallisation.
2. The polymer mixture according to claim 1, characterised in that under comparable processing conditions of P(i) and of P(i) + P(j)
  - a) the quotient of the modulus of elasticity  $E(i, j)$  of P(i) + P(j) and the modulus of elasticity  $E(i)$  of P(i),  $E(i, j)/E(i)$  is  $>1.1$ , preferably  $>1.3$ , more preferably  $>1.5$ , most preferably  $>2.0$  and in each case  $<4$ ; and/or
  - b) the quotient of the yield stress  $sy(i, j)$  of P(i) + P(j) and the yield stress  $sy(i)$  of P(i),  $sy(i, j)/sy(i)$  is  $>1.1$ , preferably  $>1.2$ , more preferably  $>1.3$ , most preferably  $>1.5$  and in each case  $<3.0$ ; and optionally
  - c) if there is a fraction A(j) of P(j) relative to P(i) + P(i) in wt.% within the range  $1 < A(j) < 15$ , the quotient of the breaking elongation  $eb(i, j)$  of P(i) + P(j) and the breaking elongation  $eb(i)$  of P(i),  $eb(i, j)/eb(i)$  is  $>1.01$ , preferably  $>1.03$ , more preferably  $>1.05$ , most preferably  $>1.10$  and in each case  $<1.5$ .
3. The polymer mixture according to claim 1 or claim 2, characterised in that the quotient of the MFI(i, j) of the mixture of P(i) + P(j) and the MFI(i) of P(i),  $MFI(i, j)/MFI(i)$  is  $>1.2$ , preferably  $>1.5$ , more preferably  $>2.0$ , most preferably  $>3$  and in each case  $<500$ .

4. The polymer mixture according to any one of the preceding claims, characterised in that under comparable processing conditions of P(i) and of P(i) + P(j), the quotient of the crystallinity K(i, j) of P(i) + P(j) and the crystallinity K(i) of P(i),  $K(i, j)/K(i)$  is  $>1.03$ , preferably  $>1.05$ , more preferably  $>1.1$ , most preferably  $>1.2$  and in each case  $<3$ .
5. The polymer mixture according to any one of the preceding claims characterised in that the fraction A(j) of P(j) relative to P(i) + P(j) in wt.% is in the range  $1 < A(j) < 90$ , preferably  $2 < A(j) < 85$ , more preferably  $3 < A(j) < 80$ , most preferably  $5 < A(j) < 75$ .
6. The polymer mixture according to any one of the preceding claims characterised in that P(i) has a degree of branching  $<3 \times 10^{-2}$ , preferably  $<1 \times 10^{-2}$ , more preferably  $<5 \times 10^{-3}$ , most preferably  $<1 \times 10^{-3}$  and P(j) has a degree of branching  $<5 \times 10^{-2}$ , preferably  $<1 \times 10^{-3}$ , more preferably  $<1 \times 10^{-3}$ , most preferably  $<1 \times 10^{-4}$ .
7. The polymer mixture according to any one of the preceding claims characterised in that P(j) has a polydispersity  $<30$ , preferably  $<20$ , more preferably  $<10$ , most preferably  $<5$ .
8. The polymer mixture according to any one of the preceding claims characterised in that P(i) and/or P(j) have long-chain branchings which have a degree of polymerisation  $>20$ , preferably  $>30$ , more preferably  $>40$ , most preferably  $>50$ .
9. The polymer mixture according to any one of the preceding claims characterised in that P(i) or the sequences A of P(i) is a polyolefin, especially a polypropylene or polyethylene such as VLDPE, LDPE, LLDPE, HDPE, HMWPE, UHMWPE.
10. The polymer mixture according to any one of the preceding claims characterised in that P(i) is a polyolefin and P(j) is selected from the following groups: n-alkanes  $C_nH_{2n+2}$ ; isoalkanes  $C_n$ ; cyclic alkanes  $C_nH_{2n}$ ; polyethylene wax; paraffins and paraffin wax of mineral

origin such as macrocrystalline, intermediate or microcrystalline paraffins, brittle, ductile, elastic or plastic microcrystalline paraffins; paraffins and paraffin wax of synthetic origin; hyper-branched alpha olefins; polypropylene wax.

11. The polymer mixture according to claim 9, characterised in that P(j) has a density in g/cm<sup>3</sup> of >0.9, preferably >0.925, more preferably >0.950, especially >0.970, most preferably >0.980 and/or P(j) has a melting or dropping point in °C of >80, preferably >100, more preferably >110, especially >120, most preferably >125.
12. The polymer mixture according to any one of the preceding claims characterised in that the polymer mixture in the form of a thermoplastic melt is prepared by means of a dispersively and distributively acting mixing system, especially by means of a double-screw extruder or a single-screw extruder with mixing section or a Buss-Ko kneader and optionally after preparation is present in the form of granules, pellets, powder, macro- or micro-fibres, as film, casting, continuous casting, extrudate, thermo-shaped part and the like.